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**To:** Mr. Hoang Nguyen, Primary Examiner  
Art Unit 3748

**Fax number:** 571 273 8300

**Date:** 9/8/2006

## A facsimile from

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**Regarding:** Patent application No. 10/519,378

**Comments:**

Dear Mr. Hoang Nguyen,

Below are my thoughts regarding your assessment of my patent application No. 10/519,378. Please feel free to contact me should you require any further clarification.

{The below points particularly relate to claims 3 - 9 where 7-9 were rejected by examiner as being in improper form because of multiple dependent claim 3. Accordingly, claims 7 - 9 were not further treated on the merits by examiner.}

This multi-stage solar concentrator incorporates a planar solar collector which includes a plate with four reflective side walls. In addition, Luminescent dopants for shifting the wavelength of incident solar radiation may be utilised. Also, an array of tilted pyramidal reflector base for redirecting radiation into the acceptance angle of the compound parabolic solar concentrator and oven combination, may be utilised.

This encapsulation enables a static compound solar collector to collect all incident radiation (including both direct and diffuse sunlight) and direct waves into the compound concentrator and solar oven for maximum concentration.

**DIFFERENCES AND USEFULNESS FROM PRIOR ART**

Photovoltaics only use three reflective sides not four for encapsulation.

In the past a multistage concentrator that included a planar concentrator needed to use tracking as only direct sunlight could be accepted.

This invention utilises a multistage concentrator (including a planar concentrator) that through encapsulation can accept all incident sunlight (direct and diffuse) without having to track direct sunlight. This trapped radiation can then be directed by the base pyramidal reflectors into the acceptance angle of the parabolic compound concentrator.

In the past a compound parabolic concentrator with an attached planar concentrator could only accept direct sunlight and thus required expensive tracking.

Thus the usefulness of the invention is that a static compound concentrator is less expensive, requires less maintenance (no gymbal mechanisms to maintain) and is able to utilise all incident radiation. When only direct sunlight is utilised approximately 40% of diffuse sunlight is wasted.

#### NON-OBVIOUSNESS

In my research I have not come across a similar multi stage concentrator that is static and utilises encapsulation to concentrate all incident and diffuse sunlight to an extremely high temperature.

I have also not seen the use of encapsulation that incorporates all walls to be reflective.

#### PAST

In the past it was common to use to use a solar concentrator to generate heat in a solar oven of a MHD system (LEE). However the solar concentrators used typically in the 1970's were an array of heliostats not the multistage system described by Harrington.

The Harrington invention synthesises known techniques from the 1970's (e.g. parabolic compound concentrators and solar oven) and combines these with known photovoltaic techniques from the late 1990's and early 2000's (e.g. encapsulation, reflective sides, luminescent dopants, base pyramidal reflectors and wave guidance).

Nowhere in my research have I come across such a synthesis of multistage concentrators and solar oven which would suggest that such a combination is non-obvious.

This is particularly true when one considers that photovoltaics generally focus on techniques that minimise the amount of radiation as the higher the heat the lower the efficiency of the photovoltaic cells.

In contrast, the research from the 1970s in thermodynamics focused on achieving an extremely high concentration for ionisation in a solar oven particularly for an MHD process.

In particular, the examiner appears to have based the opinion of obviousness on the fact that it is well known to combine a planar concentrator with a compound parabolic concentrator. Harrington has no argument with this.

Harrington considers that it is **non-obvious** to use the **encapsulation wave guiding technique in the planar concentrator** (which directs the said waves into the correct angle of acceptance of the compound parabolic concentrator) **for maximum concentration**.

This acceptance of both **direct and diffuse sunlight** and subsequence guidance into the **throat of the parabolic concentrator** and then to the solar oven is what is both **unique and non-obvious**.

In addition, I had spoken by phone by Professor Roland Winston who said that he had not heard of this static, multi stage (encapsulation) solar oven being done before. Secondly, notwithstanding the differences in rules of patent format, the Australian patent examiner gave a very good report for this patent application and recommended that I contact NREL.

Subsequently, I have contacted NREL and although some scepticism was suggested as to the efficiency of the wave direction in the encapsulated plate, none of the above parties ever suggested that the invention was obvious. This would seem pertinent considering that all of the above parties are experts in this field.

In addition, if needed I could contact the Australian patent office to request that any notes made by the Australian patent examiner be passed onto you for your review.

Thank-you for your reconsideration. I am able to contact by email at

jpharrington66@msn.com

or by phone at

303 413 8206.

I appreciate your feedback.

Yours sincerely,

Juliette Harrington